

# Data Volume and Trigger

- What's the Data Volume?
  - Use assumptions from the LOI (3 March 2003)

	Channels	Occupancy (AuAu 10% central)
1 <sup>st</sup> barrel (pixel)	1.3M	<1%
2 <sup>nd</sup> barrel (strip)	92k	12%
3 <sup>rd</sup> barrel (strip)	123k	7%
4 <sup>th</sup> barrel (strip)	154k	5%
Endcaps (strip)	2.8M	<3%

- Further assumptions about data handling (naive!):
  - 8-bits per strip (non-suppressed)
  - 32-bits per hit strip/pixel (zero suppressed)
  - Nothing included for PHENIX data format, headers, etc.
  - Assume 1kB = 1000 bytes (2.4% overage)

# Data Volume (II)

- Based on these assumptions (see previous slide):

## VTX AuAu (10% Central) Event Size

	no suppression	pixel zero suppr.	zero suppression
1 <sup>st</sup> barrel (pixel)	163kB	52kB	52kB
2 <sup>nd</sup> barrel (strip)	92kB	92kB	44kB
3 <sup>rd</sup> barrel (strip)	123kB	123kB	34kB
4 <sup>th</sup> barrel (strip)	154kB	154kB	31kB
Endcap	2,800kB	2,800kB	336kB
<b>TOTAL</b>	<b>3,332kB</b>	<b>3,221kB</b>	<b>497kB</b>

- Admittedly naïve assumptions, but probably in the right ballpark
- Do we know minbias AuAu, pp, dAu occupancies?
- Need to further revise these estimates for DAQ planning.

# Trigger Considerations

- LOI called for LVL-1 triggers (aerogel, electron, muon) followed by use of VTX in LVL-2 - this is likely OK for the full physics goals of VTX.
- Rejection adequate in AuAu (10x design luminosity)?
- Rejection adequate in pp?
- Rejection adequate in dAu (pA in general)?
- Only if the answer to the above three is “no” would you consider a displaced vertex trigger at LVL-1
  - Not even clear there is an answer!
- Possibly a hardware LVL-2 running directly on readout data
  - Processor-based, timeout with default accept
  - Need to see full segments of the detector – copy readout fiber data into dedicated hardware? Build this into the FEM?